Index

Actinic rays and squamous cell lesions, 73
Adenoma sebaceum in Bourneville's syndrome, 22, 24
Adenoviruses, 199–200
Adnexal lesions in neurofibromatosis, 41–42
Age
  and Bourneville's syndrome, 23–24
  and sebaceous carcinomas, 227–228, 252
Aneurysm(s)
  arteriovenous, 45
  intracranial arteriovenous, in Wyburn-Mason syndrome, 44, 45
Angiogram(s), 157–161
  normal, 86–87
  subtracted magnification, 160
Angiography, 85
  cerebral, in Wyburn-Mason syndrome, 45
  high-quality, 150, 151
Angioma(s)
  capillary, of retina, 114, 117
  facial, 12, 17, 19, 21
  retinal, 8, 9, 10
Angiomatoid component of iridic malignant melanoma, 184–185
Angiomatosis retinae. *See* von Hippel's disease
Angiomyolipomas, 28
Anterior chamber angle, malformation of, in Sturge-Weber syndrome, 15, 17
Antigens
  tumor-specific, 200
  virus-specific, 216
Aqueous, cytological examination of, 58–59
Argon layer in retinal angiomas, 11
Armed Forces Institute of Pathology, 226
  Registry of Ophthalmic Pathology, 177, 178, 226
Arteriography
  internal carotid, 148, 159
  morbidity, 151
Arteriovenous malformation, 46
A-scan. *See* Ultrasonography, time-amplitude
"Ash-leaf" sign, 25
Astrocytomas, subependymal giant cell, 27
Ataxia telangiectasia, 2, 42–44
  ocular features, 43–44
A-type virus-like particles in neuroblastoma cell, 207

Basal cell carcinomas, vs. sebaceous carcinomas, 253
Bascom Palmer Eye Institute, 120
Baylor College of Medicine, 226
Bear-track pigmentation, 65
Biopsy
  choroidal, 164–165
  danger of local spread, 173
  danger of metastasis, 172
  intraocular, 164
  methods, 163
Blood, locules of, simulating hemangioma of iris, 183, 185
Blood vessels in malignant melanoma of iris, 183, 187

Blurring patterns in tomography, 146
Bone defects in neurofibromatosis, 34
Bourneville's syndrome, 1, 22–30
  central nervous system involvement, 25–27
  cutaneous involvement, 24–25
  occurrence and heredity, 22–23
  ocular involvement, 28–30
  prognosis and treatment, 30
  signs and symptoms, 23
  visceral involvement, 28
Bovine ocular carcinoma, 215
Bowen's disease
  possible viral etiology, 214
  use of term, 71
Bowman's membrane in epibulbar epithelial tumors, 74, 79, 80
Brain, lesions of, in Bourneville's syndrome, 25, 26
"Brainstones," 25, 26
Brain tumors in Bourneville's syndrome, 27
Breast carcinoma, metastatic in the choroid, 105, 106
Bruch's membrane
  in choroidal malignant melanoma, 102, 103, 185
  in fluorescein angiography, 86, 88, 94, 98, 100, 107
B-scan. *See* Ultrasonography, scanned intensity modulated
Bulbar conjunctiva, squamous cell lesions of, 72
Buphthalmos
  and facial angioma, 11
  in neurofibromatosis, 42
  in Sturge-Weber syndrome, 15
  surgical treatment, 21
Burkitt's lymphoma, 198, 199
  similarity to retinoblastoma, 202
  viral etiology, 216

Café-au-lait patches, 25, 31
Calcification, intracranial, and mental retardation, 24
Caldwell view, 146
Cancer and viruses, 196–201
Carcinoma(s). *See also* Sebaceous carcinoma(s)
  diffuse, 226
  diffuse epibulbar, 72, 73
  invasive squamous cell, 72, 73
    possible viral etiology, 215
  thyroid, and pheochromocytoma, 38, 39, 40
Carcinoma-in-situ, 72, 73
  cells from, 215
  progression to squamous cell epithelioma, 77
Caruncle, sebaceous carcinomas of, 232, 233, 252
Central nervous system in von Hippel–Lindau disease, 3
Chalazion-like mass, 237
  in sebaceous carcinoma, 235
Children
  cancer in, 199
  ocular tumors in, 152
  retinoblastoma in, 129, 201
  rhabdomyosarcoma in, 211
  sebaceous carcinoma in, 252
Chlormerodrin Hg 197, 149
Choriocapillaris and fluorescein, 86, 87, 88
Chorioretinal lesions produced by ultrasound, 141–142
Chorista, defined, 2
Choristoma, defined, 2
Choroid, serous and hemorrhagic detachment of, 110
Choroidal lesions
  incisional biopsy for, 164
  posterior, biopsy of, 171–172
Choroidal nevus, pigmented, with overlying drusen, 95
Choroidal tumor(s), 90–111
  pigmented, 97
Choroidectomy, partial, 165
Chromosomal abnormalities in neoplasia, 204
Ciliary body
  hemangioma of, 177

malignant melanoma of, 58
serous and hemorrhagic detachment of, 110
City University of New York, Mount Sinai School of Medicine, 177
Coats's disease, 120
compared with von Hippel's disease, 7
exudative retinopathy of, 5, 7
Colony inhibition technique, 203
Columbia University, Institute of Ophthalmology, 226
Conjunctival telangiectasia, 43, 44
Conjunctivitis and masquerade syndrome, 82
Conray, 148
Contrast material, toxic reactions to, 147
Convulsions
in Bourneville's syndrome, 22, 30
in Sturge-Weber syndrome, 14, 21
Cornea, dysplastic lesion of, 74, 78
Corneal nerves, "myelinated," in neurofibromatosis, 36
Cortical tubers, 26
Cranial fossa and tumors, 151, 159
Cryotherapy in retinal angiomas, 11
Cystoid degeneration in melanoma, 101–102
Cysts, orbital, ultrasonograms of, 132–133
Cytological examination
of aqueous, 58–59
in epibulbar epithelial tumors, 80–81
C-type particles, electron micrograph of, 197

Decibel reserve (term), 137
Dermoid fossa, 154
Desoxyribose nucleic acids (DNA), 195
Diathermy in von Hippel's disease, 10
Doheny, Estelle, Eye Foundation Laboratory, 72, 80
Dyskeratosis
epibulbar, 74, 76
transition from normal to abnormal epithelium, 64, 79
use of term, 71
Dysplasia, use of term, 71

EB virus, 199
Echoes, retrobulbar vs. intraocular, 136
Echogram, normal, 121, 122, 124, 127
Electrolysis in von Hippel's disease, 10
Electron-microscopic examinations of retinoblastoma, 202
Electron microscopy and A, B, or C viral particles, 198
Elephantiasis neuromatosa, 32, 34
Encephalotrigeminal angiomatosis. *See* Sturge-Weber syndrome
Enophthalmos, pulsating, 35
Enucleation in diagnosis of melanotic lesions, 67
Epibulbar epithelial tumors
classification, 72–73
diagnosis, 80–81
malignant, 71
transition from abnormal to normal tissue, 74, 75
treatment, 79–80
Epibulbar lesion, flat dysplastic, 77
Epibulbar tumor, broad-based, 74, 75
Epileptic seizures
in Bourneville's syndrome, 22, 30
in Sturge-Weber syndrome, 14, 20, 21
Epiloia (term), 22
Epithelial lesions
benign, 72
premalignant and malignant, 72, 73
Epitheliomas
basal cell, 72, 73
multicentric, 73
Epstein-Barr (EB) virus, 199
Exenteration in orbital invasion, 238

Exophthalmos, 153
  arteriogram, 160, 161
  endocrine, ultrasonograms, 135–136
  and mucoceles, 152, 154
  in orbital tumors, 145
  orbitogram, 158
  progressive, plain film of, 156, 157
  pulsating, in neurofibromatosis, 35
Eyebrow, tumors of, 230
Eyelids
  elephantiasis of, 34
  sebaceous carcinoma of, 225, 252, 254
  thickened, in neurofibromatosis, 39, 40
  tumors of, 233–237
    of viral etiology, 212–216

Fibroma molluscum in neurofibromatosis, 31
Films, radiographic, 145–146
Fluorescein angiography, 172
  of choroidal tumor, 92
  in diagnosis of intraocular tumor, 130
    differential diagnosis, 85
  general principles of interpretation, 87–90
  vs. intraocular biopsy, 173
  and ultrasonography, 137–139
Fluorescein dye, injection of, 86–87
Fluorescence of tumors, 89
Fundus lesion
  and angiography, 87–88
  ultrasonic differentiation, malignant vs. benign, 126
Funduscopy, 85

Gastrointestinal tract, multiple neurofibromas of, in neurofibromatosis, 33
Gelatinous tumor, 77, 79
Glaucoma
  absolute, and uveal malignant melanoma, 52
  anterior vs. posterior tumors, 60
  and diagnosis of uveal malignant melanoma, 53
  in malignant melanoma, 51, 59
  mechanisms of, 53–59
  melanomalytic, 52, 58
  in neurofibromatosis, 35–36
  secondary, 16
    with cellular obstruction of open angle, 55, 57
  secondary angle-closure, underlying causes, 53–54
  in Sturge-Weber syndrome, 14–17
Gliomas
  in neurofibromatosis, 33, 41
  optic nerve, 150
Goldmann three-mirror prism in diagnosis of intraocular tumor, 130
Granuloma pyogenicum, 185, 192

Hamartia, defined, 1
Hamartoma(s), 90–98
  astrocytic, 29, 30, 114
  calcified, 25, 26
  choroidal melanocytic, 93–98
  combined pigment epithelial and retinal, 112, 113
  defined, 1
  in neurofibromatosis, 37–38
  retinal, 114–120
    endophytic astrocytic, 115
    exophytic astrocytic, 116
  vascular, 182, 190, 191
Heart, hamartomas of, 28
Hemangioma(s), 152
  of anterior uvea, 177–187
  capillary, diagnosis of, 187
  cerebellar, 3
  choroidal, 90, 190
    characteristic features of, 92
    management of, 21–22
    in Sturge-Weber syndrome, 17, 18–19
  of ciliary body, 182
  cutaneous, 13
  facial, 11

intracranial, 12, 21
of iris, true, 192, 193
of iris and ciliary body, 177
reported since 1963, 187–193
leptomeningeal, 21
racemose, in Wyburn-Mason syndrome, 44, 45
retinal, 5
cavernous, 116–118
treated with photocoagulation, 10
uveal, 190
Hemorrhage in pigmented lesions, 67
Hemosiderin in iris, 183
Henkind, Dr. Paul, 19
Heredity
in Bourneville's syndrome, 22–23
in neuroblastoma, 205
and neurofibromatosis, 31
and retinoblastoma, 202
and rhabdomyosarcoma, 211
in Sturge-Weber syndrome, 12, 20–21
in von Hippel's disease, 3
Herpesvirus, 198, 215
Hertel exophthalmometer, 135
Hyperfluorescence
and choroidal tumor, 92
of fundus lesion, 88
Hyperostosis in meningioma, 153, 155
Hyperplasia
massive pseudoepitheliomatous, of retinal pigment epithelium, 68
transition to neoplasm, 68
Hyphema, 152
in iridic malignant melanoma, 183–184
spontaneous, 178, 179, 180, 188
Hypofluorescence
of fundus lesion, 88
in pigmented choroidal nevus, 93, 94

IBR (infectious bovine rhinotracheitis), 215
Immunological methods in demonstrating viral agent, 203
Immunosuppressive drugs and molluscum contagiosum, 213
Infection, productive, as effect of viruses, 196
Inflammation
and hyperplasia, 68
and masquerade syndrome, 81
Intraocular pressure
and location and size of tumor, 59–61
in malignant melanoma, 59, 60
Iridectomy, 164
Iridocyclectomy, 164
in hemangioma of ciliary body, 189
Iridocyclitis, unilateral, 189
Iris
hemangioma of, 177
heterochromia, in Sturge-Weber syndrome, 19–20
malignant melanoma of, 57
Iris biopsy, excisional, 164
Iris bombé, 52, 54
Iris root, ring malignant melanoma, 57
Irradiation in conjunctival tumors, 83

Keratoacanthoma, possible viral etiology of, 214
Keratosis, inverted follicular, possible viral etiology of, 215
Kidney, hamartomas of, 28
Klippel-Trenaunay syndrome, 1

Leber's miliary aneurysms, 120
Lesions. *See also specific types, as* Choroidal lesions
congenital, retinal pigment epithelium in, 65
recurrent, 77
Leukemia
animal, 198
in ataxia telangiectasia, 43
chronic myelocytic, 204
lymphoblastic, 199

Lidocaine, 147
Lindau, Arvid, 3
Louis-Bar, Madame, 42
Louis-Bar syndrome. *See* Ataxia telangiectasia
Lymphangioma, 152
Lymphomas in ataxia telangiectasia, 43

Macrophages
  melanin-laden, in glaucoma, 58
  in melanoma of choroid, 98
Macula
  senile disciform degeneration of, 64
  serous detachment of, secondary to choroidal nevus, 93, 96
Maculopapular rash in Bourneville's syndrome, 25
Magnification in radiography, 149
Malaria, hyperendemic, and Burkitt's lymphoma, 199
Malignancies, DNA-induced, 200
Masquerade syndrome, 81–83
Medullary carcinoma syndrome, 38–39
Meibomian carcinoma, 225–226
Meibomian glands, 229, 231
  and eyelid tumors, 233
  and sebaceous carcinoma, 252
  tumor arising from, 247
Melanocytes, benign choroidal, 93
Melanocytoma(s)
  pigmentation of, 93
  of optic nerve head, ultrasonograms, 127
Melanoma
  choroidal, vs. nonneoplastic and nonhamartomatous, 104–107
  clinical presentation, 51–52
  enlargement of, 98–104
  experimental production of, in hamster, 209
  malignant, 137
    case histories, 166–171
    choroidal, 19, 98–100, 125, 128–129, 185
    vs. iridic hemangioma, 183
    of iris, 186, 189
    metastasis, 173
    in neurofibromatosis, 38
    vs. pigmented hamartoma, 93–94
    vs. pigmented lesions, 66
    possible viral etiology, 207–211
    ultrasonic features, 125
    x-ray study, 152
  uveal, histogenesis, 210
  uveal malignant, 51, 61
    diagnosis of, 53
Melanotic lesions of the ocular fundus, differential diagnosis of, 66–67
Meningioma(s), 150, 153, 155
  intracranial, in neurofibromatosis, 33
  primary intraorbital, in neurofibromatosis, 33
Mental deficiency
  in ataxia telangiectasia, 42
  in Bourneville's syndrome, 22, 24, 30
  in Sturge-Weber syndrome, 13
Metallic foreign bodies, ultrasonograms of, 130
Metastasis(es)
  of conjunctival tumors, 81
  from cutaneous melanoma, 211
  from dissemination by manipulation, 172–173
  lymph node, in sebaceous carcinoma, 248, 249, 250, 253, 255
  and neoplasms of pigment epithelium, 68, 69
  possible prevention of, 217
  preauricular node, 251, 252
  in sebaceous carcinoma, 247
  of squamous cell lesions, 72
  and tumors of choroid, 104
Methylcellulose as coupling medium, 123
Molluscum contagiosum, 212–213
Mucoceles from paranasal sinus, 152, 154

National Eye Institute, 177
Neck dissection, radical, in lymph node metastasis, 255
Neoplasms
  vs. hamartomas and choristomas, 2
  immunological rejection of, 217
Neoplastic growth, vs. hyperplastic, 63–64, 68
Neoplastic tissue, ultrasonic patterns, 139
Neuroblastoma, and retinoblastoma, 205–206
Neurofibromatosis, 31–42
  central nervous system involvement, 32–33
  cutaneous involvement, 31–32
  and glaucoma, 35–36
  involvement of face and ocular adnexae, 34–35
  involvement of ocular structures, 36–38
  occurrence and heredity, 31
  prognosis and treatment, 41–42
  visceral and skeletal involvement, 33–34
Neurosurgical procedures in Sturge-Weber syndrome, 21
Nevi, 93–98
Nevoxanthoendothelioma, 178
Nevus cells and malignant melanomas, 210
Nevus flammeus. *See* Angioma(s), facial
Nodules, in iris, in neurofibromatosis, 36
Nucleic acid in viruses, 195

Ocular lesions in neurofibromatosis, 42
Ophthalmoscope in diagnosis of intraocular tumor, 85, 130
Ophthalmoscopy, indirect, 172
  vs. intraocular biopsy, 173
Optic nerve in von Hippel's disease, 4, 8
Orbit, tumors of, 238–243
Orbital cysts, ultrasonograms of, 132–133
Orbital enlargement caused by muscle cone tumor, 152, 153
Orbital tissue, normal, 132
Orbitograms, 146–147, 150, 151, 157, 158

Papilloma(s)
  infectious and noninfectious, 72, 73
  viral etiology, 213–214
Papanicolaou method, 80
Papovavirus, 200
Peripheral anterior synechiae, 55, 56
Phakomas, retinal, 29, 30
  vs. retinoblastoma, 28
Phakomatoses, defined, 1
Philadelphia chromosome and chronic myelocytic leukemia, 204
Phlebogram(s), 150, 151
  orbital, 157, 159
Phlebography, 147–148
Photocoagulation in von Hippel's disease, 10
Pigment epithelium
  action of, 86
  developmental tumors of, 111–112
  hemorrhagic detachment of, 107–109
  hypertrophy of, 111–112
  in malignant melanoma, 101
  primary hyperplasia of, 112
  reactive hyperplasia of, 112–114
  serous detachment of, 107, 108
Pigmented lesions, differential diagnosis, 66–69
Placoid thickening of the choroid in neurofibromatosis, 37
"Plethoric glaucoma" theory, 16
Plexiform neurofibroma in neurofibromatosis, 31–32, 34
Pneumoencephalography, 149–150
Pneumonia in ataxia telangiectasia, 43

Polaroid camera, use in ultrasonography, 124
Polycythemia, diagnosis of hemangioma in, 182
Polyoma virus, 199
Port wine stain. *See* Angioma(s), facial
Proparacaine hydrochloride, 123
Proptosis
  in neurofibromatosis, 41
  unilateral, ultrasonography in, 133–136
  in Wyburn-Mason syndrome, 46
Protein, viral, 196
Protein synthesis, 195
Pseudomonas pneumonia in ataxia telangiectasia, 43
Pseudoproptosis, ultrasonograms of, 134
Pseudotumors, ultrasonogram of, 128, 129, 135
Purkinje cells, loss of, in ataxia telangiectasia, 43

Race
  and Bourneville's syndrome, 23–24
  and sebaceous carcinomas, 227–228
Radiation
  in lymph node metastasis, 255
  ultrasonic, 124
Radiation therapy in von Hippel's disease, 10
Radioactive phosphorus (^{32}P) testing in diagnosis of intraocular tumor, 130
Radiographic methods in diagnosis of ocular and orbital tumors, 145–150
Radiographic study, aims of, 150–151
Radiographs, stereoscopic, 146
Radioisotope scanning, 149
"Railroad track" sign, 13, 14
Registry of Ophthalmic Pathology, 177, 178, 226
Renografin, 147, 157
Respiratory infections in ataxia telangiectasia, 43
Retina
  congenital grouped pigmentation of, 65
  cystoid degeneration in pigmented hamartomas, 93, 97
  hemorrhagic detachment of, 107–109
  peripapillary angioma of, 7
Retinal detachment, 9
  in cavernous hemangiomas, 90
  chronic, and rubeosis iridis, 55
  and large tumor, 60
  in malignant melanoma, 54
  and retinoschisis, 111
  rhegmatogenous, ultrasonogram of, 125, 126, 127, 128, 141
  in Sturge-Weber syndrome, 15
  ultrasonograms, 130
Retinal motility, ultrasound as test of, 141
Retinal pigment epithelium
  congenital discoid hypertrophy of, 65–66
  lesions of, 63
Retinoblastoma(s), 119, 120
  vs. astrocytic hamartomas, 114
  bilateral, x-ray film of, 151
  case history, 244
  chromosome studies, 204
  possible viral etiology, 201–205, 216
  postradiation tumors, 243
  ultrasonic examination, 127, 129
  ultrasound in treatment, 142
Retinoschisis, 110–111
Retrobulbar injection, 147
Rhabdomyosarcoma
  electronmicrograph of, 212
  possible viral etiology, 211
Rhegmatogenous detachment, 110–111
Rhinotracheitis, infectious bovine (IBR), 215
Ribonucleic acids (RNA), 195
Rous sarcoma virus, 195

Rubeosis iridis with peripheral anterior synechiae, 54–55, 56
Ruby laser in retinal angiomas, 11

Sarcoidosis, systemic, case history, 165–166
Scans, orbital, 149
Schwannoma, malignant, 33
Scleral trap-door resection, 172
Sebaceous carcinoma(s)
  behavior and followup, 247–252
  case history, 252
  clinical findings, 255
  duration of, 249
  with intraepithelial pagetoid spread, 241
  involving upper and lower lids, 240, 243
  metastatic, 247, 251
  pathological diagnosis, 246–247
  postradiation, case histories, 244–245
  presenting as diffuse thickening of the lid, 238
  presenting as large cutaneous horn, 242
  simulating basal cell carcinoma, 253
  site of origin, 228–229
  treated as blepharoconjunctivitis, 239
Sebaceous glands, types of, 225
Sex
  and Bourneville's syndrome, 23–24
  and sebaceous carcinomas, 227–228
Simian viruses, 199, 200
Skin lesions
  in ataxia telangiectasia, 42
  in Bourneville's syndrome, 24
  in neurofibromatosis, 31
Slit lamp in diagnosis of intraocular tumor, 85, 130
Smith, Robert William, 31
Squamous cell lesions, etiology, 73–74
Squamous epithelium, changes in, 71
Stereophotography, 85
Sturge-Weber syndrome, 11–22
  central nervous system involvement, 12–14
  choroidal lesion in, 92–93
  cutaneous involvement, 12
  diagnosis, 20–21
  and diffuse cavernous hemangioma, 90
  iridic neovascularization in, 180
  occurrence and heredity, 12
  ocular involvement, 14–15
  prognosis and treatment, 21–22
Subretinal masses vs. neoplastic lesions of choroid, 105
Subtraction, photographic, 148–149
"Subtraction mask," 149
Surgery, ophthalmic, biopsy in, 163

Tarsus as site of sebaceous carcinoma, 229
Techneticum 99, 149
Telangiectasis, retinal, 119–120
Textbook of Ophthalmology, 178
Tomograms, 146, 153, 157
Touton giant cells in juvenile xanthogranuloma, 180, 181
Transformation, and tumor virus, 196
Transillumination in diagnosis of intraocular tumor, 130
Tuberous sclerosis. *See* Bourneville's syndrome
Tumefactions
  exudative, 88
  transudative, 88
"Tumor blush," 160, 161
Tumor cells, virus-like particles in, 197
Tumor-cyst patterns
  homogeneous, 134–135
  nonhomogeneous, 135, 136
Tumor diagnoses, accuracy of, 173–174
Tumor(s). *See also* Epibulbar epithelial tumors
  choroidal, diagnosis of, 165
  ciliary body, excision of, 164

Tumor(s)—*Continued*
defined, 88
echo patterns, vs. vitreous hemorrhage, 130–131
experimental establishment of, 204, 206–207
intracanalicular, 157
intracranial component of, detection, 151
intraocular
detection by ultrasound, 124, 125–131
diagnosis, 165
differential diagnosis, 85
therapeutic ultrasound in, 140–142
intraocular epithelial, 206–207
iris, 164
lacrimal gland, 152–153
invasion of bone, 153, 155
and sebaceous carcinoma, 253
malignant, in neurofibromatosis, 34
malignant and benign, ultrasound in differential diagnosis, 127, 129
multiple, in neurofibromatosis, 32
muscle cone, 147, 152
detection of, 150
orbitograms in, 157
neuroepithelial, 111–120
ocular, radiology of, 151–152
orbital, 145, 238–243
radiographic findings in, 152–162
postradiation, 243–246
retinal, fluorescein angiogram of, 6
retinal pigment epithelium, malignant changes in, 68
retrobulbar, detection by ultrasound, 124, 131–136
ultrasonograms, 134
sebaceous, 225. *See also* Sebaceous carcinoma(s)
solid, 88–89
solid orbital, acoustical behavior of, 132–133
spontaneous, 68
Tumor viruses
DNA, 199–201
RNA, 197

Ultrasonic generator for vitreous hemorrhage, 140
Ultrasonics, tumor-negative and tumor-positive criteria, 127–128, 131
Ultrasonogram(s)
in malignant melanoma of choroid, 128
normal orbital, 132
of orbital cysts, 132
of retrobulbar lesions, vs. normal, 133
Ultrasonographic differentiation, cysts vs. solid tumors, 133
Ultrasonography
and fluorescein angiography, in diagnosis of intraocular tumors, 137–139
quantitative, 136–137
scanned intensity modulated, 122, 129, 131, 133, 134, 137
selective, 129–130
time-amplitude, 122, 123, 129, 131, 133, 134
equipment, methods, and principles, 123–124
Ultrasonoscope, Ekoline 12, 123
Ultrasound, 121
in diagnosis of uveal malignant melanoma, 53
Uvea
anterior, hemangioma of, 177–187
neurofibromatosis of, 37
Uveal lesions, diagnosis by biopsy, 164

Veins, displacement by tumors, 158–159
Venograms, 147, 148
Verruca plana, 213
Verruca vulgaris, 213
Verrucae, viral etiology, 213–214
Viral oncogenesis, 196

Viruses
four characteristics of, 195
and genetic strain, 202
identification of, 196
Visceral cancer and Bowen's disease, 214
Vitreous body hemorrhage, 152
echoes, vs. intraocular tumor, 140
ultrasonic diagnosis, quantitative measurements in, 137
ultrasonograms, misinterpretation of, 130
von Hippel, Eugen, 2
von Hippel–Lindau disease, 3
vs. Sturge-Weber syndrome, 20
von Hippel's disease, 1, 2–11, 117
nervous system involvement, 3–4
occurrence and heredity, 3
ocular involvement, 4–10
prognosis and treatment, 10–11
visceral involvement, 4
von Recklinghausen's disease. *See* Neurofibromatosis

Warts, 213, 214
Washington University School of Medicine, Laboratory of Ophthalmic Pathology, 165
Waters view, 146
Wyburn-Mason syndrome, 44–46

Xanthogranuloma, juvenile, vs. hemangioma, 178, 179, 180
Xenon photocoagulation in choroidal hemangiomas, 92

Zeis glands, 225, 229, 231
and eyelid tumors, 233
and sebaceous carcinoma, 252
tumor arising from, 247
Zeiss fundus camera, 85

Index

Abortion
  rubella infection and, 70, 140
  therapeutic, use of, 14–15, 17, 68
Actinomycin D, rubella virus and, 22
Adamantadine, rubella virus and, 33
Adenine arabinoside in neonatal herpes, 209
Age distribution of rubella infections, 36, 42, 43, 47–48, 68, 139
Amaurosis congenita (tapetoretinal degeneration), 92
Amblyopia, 91
Anemia
  in cytomegalic inclusion disease, 170
  in rubella, 9, 10
  transfusion for, 10
Aniridia, 116
Antibodies
  in herpesvirus infections, 193–194, 207–208
  in rubella
    assay methods, 4 ,14, 35–36
    circulating at birth, 14
    immunity and, 36
    intravitreal rubella virus inoculation and, 148, 152, 153, 154, 155, 156, 159–162
    mode of ocular production, 162–163
    production in congenital rubella syndrome, 41
    titer increases, 35, 36, 37
Antigens
  antigenic types of herpes simplex, 192–193
  rubella virus, 25, 48
    antigenic viral types, 22
    cataract surgery results and cellular-immune response to, 84–85, 86
    complement-fixing, 26, 28, 48
    hemagglutinating, 25, 26–27, 48
    immunoprecipitating, 25, 26, 28–29, 48
    intraocular sensitivity reaction and, 147–165
Aortic coarctation, 6, 71
Aortic stenosis, 6
Aphakia correction, 112, 118–119
Atrial septal defect, 71
Autostimulation, ocular, 74–75

Birth weight, rubella and, 34, 40, 70, 71
Bone changes in rubella, 9, 10–11, 70, 71
  in animals, 34, 140
  osseous changes, 10, 11, 71
  radiolucent areas, 71, 124
Buphthalmos, 127, 128, 130, 131, 132, 133, 134, 135

Cardiopathy. *See also specific condition*
  animal maternal inoculation with rubella virus and, 142, 143
  congenital rubella syndrome and, 67, 70, 71
  incidence, 6
  ocular defects associated with, 70, 124, 125
  types, 6

Cataract surgery. *See also* Cataracts
cellular-immune reaction to rubella virus and, 84–85, 86
discission and, 79, 81, 85
early aphakic correction after, 112, 118–119
glaucoma secondary to, 132–133, 135
iridectomy and, 78, 81, 84, 147
microphthalmia and, 115
nystagmus and, 115
phthisis bulbi as complication of, 77–86, 147, 148
postoperative uveitis, 147
in presence of glaucoma, 132, 135
procedures of choice, 118, 119
strabismus and, 112
timing, 117
viral presence and, 77, 78, 80, 83–85
Cataracts
neonatal herpes and, 191, 198, 202, 203, 210
radiation and, 93
rubella and, 70, 72, 77
congenital rubella syndrome, 67
development, 7, 72
esotropia with, 115
glaucoma with, 131–132, 134, 135–136
incidence, 6–7, 77, 111
iris hypoplasia and, 116
microphthalmia with, 72, 73, 107, 108, 109, 115
retinopathy with, 89, 90–91, 92, 115
strabismus with, 113–114
tapetoretinal degeneration with, 92
therapy, 72–73. *See also* Cataract surgery
vision and, 90–91, 100, 113, 114–115
Cells
immune mechanism. *See* Immune mechanism
neuron inclusion bodies in subacute sclerosing panencephalitis, 217–218, 221
rubella virus and, 5, 24–25, 40, 48
carrier cultures, 32
chronic infection and, 32
in congenital rubella syndrome, 14, 71
growth and multiplication and, 71, 145
viral replication, 29–31
Central nervous system. *See also specific condition*
cerebral lesions after encephalitis, 116
inoculations of animals with rubella virus and, 138
neonatal herpes and, 196
rubella and, 12, 70, 71
altered tonic convergence, 116–117
glaucoma, cerebral palsy, and deafness, 128–130, 131, 135
strabismus and, 11, 112–113
subacute sclerosing panencephalitis and, 215–221
Cerebral palsy
deafness with, 128–130, 131, 135
glaucoma with, 128–130, 135
oculomotor defects in, 113
Cerebrospinal fluid
rubella virus in, 116
in subacute sclerosing panencephalitis, 215, 216–217
Chemicals, rubella virus infectivity and, 22, 27, 28, 33
Chorioretinitis
in congenital rubella syndrome, 70
neonatal herpes and, 191, 198, 199–202, 204–205, 210
in subacute sclerosing panencephalitis, 218–219, 221
syphilitic, 92–93
Chromosomes, rubella virus and, 33, 40
Chronic infections, 32

Ciliary body
intravitreal rubella antigen inoculation and, 162
rubella and necrosis of, 126, 127
Climate, susceptibility to rubella and, 42, 45–46
Complement-fixation test
in cytomegalic inclusion disease, 177
in rubella, 26, 28, 35, 36, 48
Congenital defects in rubella. *See also specific condition*
in animals, 34
incidence, 70, 71, 77
mechanisms of production, 5, 40
nature of, 3, 4
time of fetal infection and, 5–6, 13–14, 37–38, 39, 40, 70, 111, 113
Congenital heart disease, 6
Congenital nevoid pigmentation, 94
Congenital rubella syndrome, 34–35, 37–41, 48. *See also* Fetus, rubella in; Rubella virus; *and specific condition and/or topic*
classic "rubella triad," 6
clinical manifestations of, 3–17, 70–75
expanded rubella syndrome, described, 8–9
history of, 67–68
laboratory diagnosis, 14–15
pathogenesis and immunogenesis, 12–14
prognosis, 15–16, 70
prophylaxis, 16–17
rubella compared with, 5, 67
temporal relations and clinical manifestations, 12, 13–14
virus isolation in, 38, 39
virus persistence in, 39–40, 40–41, 48, 71
Congestive heart failure, 6, 10, 15
Conjunctivitis, neonatal herpes and, 191, 195–196, 198–199, 203, 204, 210
Contact lenses, aphakic, 118–119
Cornea
diameter in microphthalmia, 72, 73, 115
opacification and scarring, 116
glaucoma with, 122, 125, 126, 130, 131, 135
transient clouding, 7
Cyanotic heart disease, 6
Cytomegalic inclusion disease. *See* Cytomegaloviruses (CMV), infection with
Cytomegaloviruses (CMV), 169–183
electron microscopy of, 174–176
family of, 169, 172
histopathological changes and, 169, 173–174
infection with
acquired, 170–171, 172
clinical manifestations, 169, 170–171
congenital, 170, 172
diagnosis, 169–170, 176–177
differential diagnosis, 177–178
epidemiology, 171–172
importance of, 183
ocular involvement in, 93–94, 170, 178–182, 183. *See also specific condition*
therapy, 183
infectivity of pools, 173
interferon and, 172
isolation of, 170
properties, 172–173
shedding, 84
Cytosine arabinoside in neonatal herpes, 209

Dawson's inclusion body encephalitis, 215–221. *See also* Subacute sclerosing panencephalitis (SSPE)
Deafness. *See* Hearing loss
Deoxyribonucleic acid (DNA)
of cytomegaloviruses, 172
RNA of rubella virus and inhibitors of, 22

Deoxyribonucleic acid (DNA)—*Continued*
rubella virus and nuclear, 144, 145
synthesis in lens, 144
Dilatation, ocular. *See* Mydriatic regimen
Discission, cataract surgery results and, 78, 81, 85
Distal axial triradius, 12
Drugs, systemic effects of topical, 74

Ear
hearing. *See* Hearing loss
maternal rubella virus inoculation and fetal, 139
Electroretinogram (ERG), 91, 105–109
in amaurosis congenita, 92
in early retinal degeneration, 95
in infectious retinopathy, 95
in microphthalmia, 91, 107, 108, 109
in nystagmus, 107, 108, 109
in radiation retinopathy, 93
in rubella retinitis, 95–96, 99, 105–109
in secondary cataracts, 107, 108, 109
in syphilitic chorioretinitis, 93
Encephalitis, 69, 71
cerebral lesions after chronic, 12
Dawson's inclusion body, 215–221. *See also* Subacute sclerosing panencephalitis (SSPE)
mortality from, 15
Endocardial cushion defect, 71
Endophthalmitis, staphylococcal, 130
Endothelial necrobiosis, fetal, 13
Epidemiology. *See also* Transmission
of neonatal herpes, 194–195, 207–208
of rubella, 41–48, 68
age and, 42, 43, 47–48, 68, 139
climate and, 42, 45–46
cyclic nature of epidemics, 41–42, 42–43, 68
exposure time and disease incidence, 42
population density and, 42–45, 47
race and, 46
sex and, 46, 47, 68
socioeconomic factors and, 46–47
Equilibrium defects, 116
ERG. *See* Electroretinogram (ERG)
Esotropia, 113
intermittent, 73
cataract and, 115
tonic convergence alterations and, 117
Ether, rubella virus and, 22, 27, 28
Exfoliative cytology
in cytomegalovirus infections, 169–170, 176–177
in herpes infections, 206
Expanded rubella syndrome, 8–9
Eye. *See* Ocular defects *and specific condition*

Face, in congenital rubella syndrome, 9
Fetus
cytomegalovirus infections in, 170
endothelial necrobiosis, 13
rubella in, 34–35, 37–41, 48. *See also* Congenital rubella syndrome *and specific topic*
development stage and effects of, 3, 5–6, 13–14, 34, 37–38, 39, 40, 70, 111, 113
maternal viremia and, 38
secondary infections, 38
transmission to fetus, 4–5, 34
virus excretion, 15
virus isolation, 14, 15, 38, 39–40
virus persistence, 39–40, 40–41, 48
Fluorescein angiography in rubella retinitis, 96, 97–98, 99–100
Fluorescent antibody test in herpes infections, 206–207
Fontanelle bulging, 9, 11, 71

Gamma globulin
for cytomegalic inclusion disease, 183

for neonatal herpes, 209
for rubella, 16, 69
Glaucoma, 116, 121–136
bilateral congenital, 122–128
buphthalmos in, 127, 128, 130, 131, 132, 133, 134, 135
cardiopathy with, 124, 125
cataract with, 130–132, 134, 135–136
cerebral palsy with, 128–130, 131, 135
corneal opacification and scars in, 122, 125, 126, 130, 131, 135
deafness with, 125–126, 127, 128–130, 131
diagnostic problems, 121
incidence, 7, 121
maternal exposure to rubella and, 133–135, 135–136
optic atrophy with, 91
postoperative, after cataract surgery, 132–133, 135
retinopathy with, 122, 123, 130, 132
therapy in presence of cataract, 132, 135
vision in, 100
Grouped retinal pigmentation, 94
Growth inhibitor, cellular production, 40
Growth retardation
in animals after maternal inoculation with rubella virus, 141–142
human rubella and, 8, 12, 40, 71, 116

Hand-wagging phenomenon, 74
Head-wagging phenomenon, 74
Hearing loss, 7–8
auditory training for, 17
cataract plus, 79–80
diagnosis, 7, 8
audiometry screening, 70
timing of, 17
glaucoma with, 125–126, 127, 128–130, 131
incidence, 7, 79–80
Heart. *See* Cardiopathy
Heart failure, 6, 10, 15
Hemagglutinating reactions of rubella virus, 14, 25, 26–27, 35, 48
Hemorrhage
etiology of retinal, 127, 135
incidence, 10
Hepatosplenomegaly
in cytomegalic inclusion disease, 170, 171
rubella and, 10, 40, 122
Herpesviruses
cytomegaloviruses and, 169, 172, 173
isolation of, 207
neonatal infection with herpes simplex, 191–210. *See also* Neonatal herpes
primary vs. recurrent infections, 193–194
virology and immunology of herpes simplex, 192–194
HI antibody test, 14
Hydrogen ion concentration, rubella virus and, 22, 27
Hypermetropia, cataract surgery and, 115

Immune globulin. *See* Gamma globulin
Immune mechanism. *See also* Antibodies; Antigens
cataract surgery results and, 84–85, 86, 163
cytomegalic inclusion disease and, 169, 171, 182
herpesvirus infections and, 192–193, 193–194
immunity defect and virus persistence, 41
intraocular reaction and intravitreal injection of rubella virus, 147–165
phthisis and, 163
rubella and, 31–33, 144–145

Immune mechanism, rubella and—*Continued*
congenital rubella syndrome, 12–14, 41
uveitis and, 147–148, 163, 165
Immunization. *See* Vaccine(s)
Immunofluorescence rubella antibody assay, 35
Immunoprecipitation rubella antibody assay, 35
Immunoprecipitation rubella antigen reactions, 25, 26, 28–29, 48
Influenza, retinitis in, 93
Interferon
cytomegaloviruses and, 172, 183
neonatal herpes and stimulators of, 209
rubella virus and, 31, 32
Intermittent esotropia, 73
Iododeoxyuridine (IDU) in neonatal herpes, 208–209
Iridectomy, cataract surgery results and, 78, 81, 84, 147
Iridocyclitis, 73
Iris
aniridia, 116
atrophy with glaucoma, 124, 129
immune response to intravitreal antigen injection, 162
rubella virus isolation from, 147
in suspected rubella infants, 74
Iris hypoplasia
associated conditions, 116
mydriatic regimen in, 73–74
pathogenesis, 74

Keratitis, neonatal herpes and, 191, 198, 199, 203, 204, 210
Keratoconjunctivitis, neonatal herpes and, 203, 205
Keratoconus, 92
Keratoglobus, 92
Kidney involvement in rubella, 71

Lens. *See also* Cataract surgery; Cataracts
DNA synthesis in, 144
protein, immunological response to rubella virus and, 155, 156, 163
rubella virus in
after animal inoculation, 137, 139, 142–143, 144–145
isolation of, 147
release and cataract surgery results, 147, 148, 163
replication, 144
Lid-elevation phenomenon, 74
Liver
hepatosplenomegaly
in cytomegalic inclusion disease, 170, 171
rubella and, 10, 40, 122
malfunction
cytomegalic inclusion disease and, 170, 171
rubella and, 10, 124–125
Lungs, experimental inoculation of rubella virus and, 138, 145
Lymphadenopathy, rubella and, 35, 68

Macromolecules, rubella virus and synthesis of, 32–33
Malformations. *See specific condition*
Measles
endemic, 43
subacute sclerosing panencephalitis and virus of, 215–216
Melanosis retinae, 94. *See also* Retina, pigmentation of
Meningitis, 12, 116
Mental retardation, 3, 4, 12, 70, 71, 80, 116
Microcephaly, 12, 70
Microphthalmia
radiation, 93
rubella, 70
cataract and, 72, 73, 115
corneal diameter in, 72, 73, 115
ERG in, 91, 107, 108, 109
incidence, 72, 111
iris hypoplasia with, 116
retinopathy with, 92

time of fetal infection and, 111
vision and, 91, 100, 113, 115
Morbilli retinitis, 93, 94
Mortality
animal inoculation with rubella virus and fetal, 141
cytomegalic inclusion disease, 170
neonatal herpes, 195
rubella, 69
congenital rubella syndrome, 15, 70
sepsis, 15
Motor disabilities, 12, 116–117
Murmur, cardiac, 6
Mydriatic regimen
after cataract surgery, 82–83, 85
in iris hypoplasia, 73–74
Myocarditis, necrotizing, 10
Myopia, 7

Neonatal herpes, 191–210
asymptomatic, 197–198
classification of, 195–196
diagnosis, 205–208, 210
disseminated, 195–196
epidemiology, 194–195, 204, 207–208
immunological aspects, 192–194
ocular involvement in, 191, 192, 195–196, 198–203, 210
pathogenesis of, 203–205
prognosis, 195
prophylaxis, 208–209
reinfection in, 204
therapy, 208, 209–210
Nucleus, rubella virus and, 25, 30
Nystagmus, 73
ERG in, 107, 108, 109
vision in, 15, 73

Ocular defects. *See also specific condition*
cerebral palsy and, 113
cytomegalic inclusion disease and, 170, 178–182, 183
neonatal herpes and, 191, 192, 195–196, 198–203, 203–205, 210
radiation and, 93
rubella and, 6–7, 67–68, 70, 72–75
alignment disorders, 113–117. *See also* Strabismus
altered tonic convergence, 116–117
aphakic optical correction, 112, 118–119
autostimulation, 74–75
cardiopathy with, 70
diagnosis, 17
establishing functional visual axis, 112, 117–118
incidence, 6
management, 112, 117–119
motility disorders, 116–117
time of fetal infection and, 111, 112–113
visual changes and, 90–91
subacute sclerosing panencephalitis and, 218–221
Oculodigital phenomena, 74
Optic nerve
congenital glaucoma with atrophy of, 91
cupping in glaucoma, 128, 129
cytomegalic inclusion disease and, 179
neonatal herpes and, 205
syphilitic chorioretinitis and, 92–93

Pancytopenia, 71
Patent ductus arteriosus, 6, 71
Phthisis bulbi, 73, 130
as cataract surgery complication, 77–86, 147, 148
as hypersensitivity reaction, 163
Phytohemagglutinin response in congenital rubella syndrome, 41
Pigmented retinopathy. *See* Retina, pigmentation of; Retinitis
Placenta
animal inoculation with rubella virus and, 138, 139
immunological relations of, with fetus, 13
transplacental rubella infection, 4, 13, 38, 39, 138, 139

Plasma membrane, rubella virus and, 24–25
Pneumonia, 10
Pneumonitis
  cytomegalic inclusion disease and, 170, 171
  rubella and, 40–41, 71
Population density, rubella and, 42–45, 47
Postinfectious retinopathy, 93, 94–95
Protein
  intravitreal rubella virus inoculation and lens, 155, 156, 163
  rubella virus and synthesis of, 31, 33
Pulmonary stenosis, 6, 71
Purine analogs in cytomegalic inclusion disease, 183
Purpura. *See* Thrombocytopenic purpura

Race, susceptibility to rubella and, 46
Radiation, ocular effects of, 93, 94
Rash in rubella, 5, 35, 36, 69
Rehabilitation, 4, 17, 77
Reinfection
  with herpesviruses, 193–194, 204
  with rubella virus, 36, 37
Replication
  of rubella virus
    age and, 139
    in lens, 144
    in tissue culture, 29–31
  of second virus, rubella virus and, 30–31
Retardation in congenital rubella syndrome, 3, 4, 12, 70, 71, 80, 116
Retina. *See also* Chorioretinitis; Electroretinogram (ERG); Retinitis
  cytomegalic inclusion disease and, 178, 179–180, 181, 182
  early degeneration, 94–95
  early stimulation, 118
  embryonic differentiation, 94
  hemorrhage, 127, 135
  maternal inoculation with rubella virus and fetal, 142, 143
  neonatal herpes and, 204–205
  pigmentation of, 90, 105
    cataract in, 115
    in cytomegalic inclusion disease, 93–94
    grouped pigmentation, 94
    in rubella retinitis, 89–90, 90–91, 105, 106, 115
    in syphilitic chorioretinitis, 92
    in toxoplasmosis, 93–94
    vision and, 115
  vessels
    in retinitis, 90
    in syphilitic chorioretinitis, 93
Retinitis. *See also* Chorioretinitis
  radiation, 93, 94
  rubella, 7, 72, 89–100
    case reports, 95–100
    cataract with, 89, 90–91, 92, 115
    differential diagnosis, 92–95
    ERG in, 95–96, 99, 105–109
    fluorescein angiography in, 97–98, 99–100
    glaucoma with, 122, 123, 130, 132
    incidence, 89
    microphthalmia in, 92
    pathology, 91–92
    pigmentation in, 89–90, 90–91, 105, 106, 115
    postinfectious, 93, 94–95
    retinal lesions in, 89–90, 105, 106
    vision in, 90, 95, 115
  in subacute sclerosing panencephalitis, 218–219, 221
  in tapetoretinal degeneration, 92
Ribonucleic acid (RNA)
  inhibition by rubella virus, 31
  of rubella virus, 22–23, 48
Rubella. *See also* Congenital rubella syndrome; Rubella virus; *and specific topic*
  clinical features, 68–70
  congenital rubella syndrome vs., 5, 67
  control of, 16–17
  differential diagnosis, 69
    from cytomegalic inclusion disease, 177–178

epidemiology. *See* Epidemiology, of rubella
exposure time and disease incidence, 42
history, 67
incidence in pregnant women, 4
pathogenesis
postnatal, 34–35, 35–37, 48
prenatal, 34–35, 37–41, 48. *See also* Fetus, rubella in
therapy, 69–70
transmission, 4–5, 15, 16, 34, 41, 42
Rubella retinitis. *See* Retinitis, rubella
Rubella virus, 21–49
antigens, 22, 25–29, 48
cellular-immune reactions to, 84–85, 86
complement-fixing, 26, 28, 48
hemagglutinating, 25, 26–27, 48
immunoprecipitating, 25, 26, 28–29, 48
biological properties, 25–29, 48
in blood, 4, 35, 38
cataract surgery results and, 84–85, 86, 147, 148, 163, 164
in cataracts, 77, 78, 80, 83–85
cells and. *See* Cells, rubella virus and
in cerebrospinal fluid, 116
cytopathic changes and, 24–25, 29–30, 31–33, 40, 48
density of, 23
excretion, 15
experimental infections with, 33–34, 137–145
fetal infection with. *See* Congenital rubella syndrome; Fetus, rubella in
in fetus vs. placenta, 38, 39
genome of, 22–23
infectivity
agents affecting, 22, 27, 28, 33
pH and, 22
tissue culture passage and, 31
interference mechanism, 30–31
interferon and, 31, 32
intraocular reaction to intravitreal injection, 147–165
isolation, 14, 68
from fetus, 14, 15, 38, 39–40
from tissue culture, 29–31
morphology, 23–25, 48
nuclear DNA and, 144, 145
persistence, 39–40, 40–41, 48, 71, 84
placental, 4, 38, 39
reinfection with, 36, 37
release from lens, 147, 148, 163, 164
replication, 35
adamantadine and, 33
age and animal, 139
in lens, 144
in tissue culture, 29–31
RNA of, 22–23, 48
shedding, 84
size of, 23, 48
taxonomy, 21
teratogenic potential, 3, 5–6, 13–14, 34, 37–38, 39, 40, 70, 111, 113
in tissue culture, 28, 29–33
replication and detection in, 29–31
virus–host cell interaction, 31–33
transmission of, 4–5, 15, 16, 34
Rubeola virus, 215–216

Sex distribution
neonatal herpes, 194–195
rubella, 68
bone changes, 71
susceptibility, 46, 47
Simian lines, 12
Skin. *See also* Thrombocytopenic purpura
dermatoglyphic patterns in rubella, 12
neonatal herpes and, 192, 196, 197, 205
Skull, congenital rubella syndrome and, 9, 11, 71
Socioeconomic factors
herpes infections and, 193, 195
susceptibility to rubella and, 46–47

Splenomegaly. *See* Hepatosplenomegaly
Steroids for cytomegalic inclusion disease, 183
Strabismus, 72, 111–119
  cataract and, 113, 114–115
  cataract surgery and, 112, 118–119
  central nervous system involvement and, 111, 112–113, 116–117
  incidence and time of fetal infection, 111, 112–114
  management, 112, 119
  predisposing factors, 111
Subacute sclerosing panencephalitis (SSPE), 215–221
  clinical manifestations, 216
  electroencephalogram in, 217
  histopathology, 217–218, 221
  laboratory studies, 216–217
  measles virus and, 215–216
  ocular manifestations, 218–221
Syphilitic chorioretinitis, 92–93

Tapetoretinal degeneration, 92
Temperature, rubella virus infectivity and, 22, 42, 45–46
Tetralogy of Fallot, 71
Throat swabs, rubella virus isolation from, 14, 15
Thrombocytopenic purpura
  cytomegalic inclusion disease and, 170
  rubella and, 9–10, 69
    in animals, 34
    congenital rubella syndrome, 70, 71
    glaucoma with, 122, 124, 135
    incidence, 9
Togaviruses, 21, 24, 48
Toxoplasmosis
  differential diagnosis, 177, 178, 179, 181
  ocular effects, 93–94
Transmission. *See also* Epidemiology
  of neonatal herpes, 194, 204, 207–208
  of rubella, 4–5, 15, 16, 34, 41, 42
Transposition of great vessels, 71

Ultraviolet light, rubella virus infectivity and, 22
Uveitis
  cytomegaloviruses and, 183
  neonatal herpes and, 203
  postoperative, after cataract surgery, 147
  rubella and, 78, 85, 132
    immune response in pathogenesis of, 147–148, 163, 165

Vaccine(s)
  herpesvirus, 209–210
  rubella, 37, 85
    development of, 68
    effectiveness, 48
    in pregnancy, 37
    rubella-like symptoms and, 48–49
    use of, 16, 17, 37
Varicella, retinitis and, 93
Ventricular septal defects, 6
Viremia
  in animal fetus after maternal rubella inoculation, 138, 139
  in rubella, 4, 35, 38
Vision. *See also* Electroretinogram (ERG)
  amaurosis congenita and, 92
  cataracts and, 90–91, 113, 114–115
  corneal opacification and, 116
  early retinal degeneration and, 95
  glaucoma and, 100
  microphthalmia and, 91, 100, 113, 115
  normal ERG and, 91
  nystagmus and, 15, 73
  retinitis and
    infectious retinopathy, 95
    pigmentary retinopathy, 115
    radiation retinitis, 93
    rubella retinitis, 90, 95, 115
  strabismus and, 113
  syphilitic chorioretinitis and, 93
Visual axis, establishment of functional, 112, 117–118

Wolff-Parkinson-White syndrome, 71

Index

Acid burns. *See* Chemical burns
Africa, corneal blindness, 14
Air injection, 185–187
Allergic reaction, 91
  to grafts, 50
Amblyopia, 88
Anatomy of cornea, 19–27
  anterior surface, 20
  basement membrane, 22–23
  differences between characteristics of cornea and sclera, 24
  endothelium, 25–26
  epithelium, 21–22
  limbus, 26–27
  limiting membranes, 26
  nerve fibers, 20
  refractive power, 20
  scleral structure, 24
  size and thickness, 19–20
  stroma, 23–24
  tear film, 21
Anesthesia, 3
  general, 154–156
    procedures, 156–157
  local, 157–159
  for regrafting, 294
Animal corneas, 51
Anterior surface of cornea, 20
Anterior synechiae to graft, 211–216
Anterior synechiotomy, 130–131
Antibiotics, 3, 8, 203–204
Antibodies, 33
Antigen-antibody reaction, 32–33
Antilymphocytic serum, 34
Antimetabolites, 34
Aphakia, 11, 14
  keratoplasty for, 115–116, 303–305
Asepsis, importance of, 159–160
Asia, corneal blindness, 13
Autografts
  contralateral, 52
  ipsilateral, 31
  penetrating, 239–241
Autologous grafts, 52
Avascularity and corneal transparency, 29–31
Azathioprine (Imuran), 34

Bacteriology of donor eyeball, 58–60
Basement membrane, 22–23
Bilateral corneal disease, 89
Biogenesis of corneal transplantation, 31–36
Blindness, corneal, 13–17
  age of onset, 15
  bilaterality of corneal lesions, 16–17
  causes of, 13
  in developing countries, 16
  extent of, 13–14
  in India, 11–12
  industrial injuries, 14–15
  keratoplasty for, 14–15, 17
  in tropical countries, 15
Blood group and Rh compatibility, donor material, 57–58
Blood in host-graft interface
  lamellar keratoplasty, 270–271
Blood staining of cornea, 375–376
Bowman's membrane, 26
Bullous keratitis, 50

Bullous keratopathy, 11, 12, 14, 115
  complication of lamellar keratoplasty, 276
  corneal edema and, 100
  graft edema and, 222–226
  treatment of, 225–226

Cadaver corneas, 51, 54
Carbonic anhydrase inhibitors, 3
Carcinoma, squamous-cell, 114, 282–284
Cardona nut-and-bolt prosthesis, 342
Cardona through-and-through prosthesis, 338–342
Case selection, 85–121, 351–352
  age of patient, 89–90
  allergic disposition of recipient, 91
  for aphakic eyes, 115–116
  chemical burns, 105–106
  conjunctiva and eyelids, 94–95
  corneal dystrophy, 104–105
  corneal edema and bullous keratopathy, 100
  corneal fistula and descemetocele, 113
  diabetes mellitus and hypertension, 91
  examples and commentary, 118–121
  factors influencing, 85–93
  general systemic considerations, 90–93
  indolent corneal ulceration, 110–111
  intraocular tension, 93
  iris incarceration and anterior chamber, 100–102
  keratoconus, 103–104
  lens opacities, 93–95
  lens and posterior segment, 93–95
  malignant pterygium, 111–112
  malnutrition, 91–92
  multiple foreign bodies, 112–113
  neoplasms, 113–115
  opacity of recipient cornea, 95–97
  preoperative visual acuity, 85–89
  psychological buildup of patient, 92
  recipient cornea, 95–102
  therapeutic keratoplasty, 109–110
  trachoma, 106–109
  vascularization, 97–100
Case study, 123–136
  choice of surgery, 129–130
  examination of eye, 126–128
  history of corneal pathology, 123–126
  preoperative control of intraocular tension, 135–136
  preoperative investigations, 128
  preparatory surgery, 130–135
    anterior synechiotomy, 130–131
    keratectomy, 132–133
    peritomy, 133–135
    symblepharon, 131–132
Cataracts, 12, 93, 94
  caused by perforating injury of eye, 299
  in eyes with gross and ectatic corneal scars, 301
  at penetrating regrafting, 301–302
  uncomplicated cataract and keratoplasty, 302–303
Chemical burns, 98, 105–106
  agents causing, 358
  case selection, 105–106
Children
  case selection, 87
  corneal blindness, 15
  keratoplasty in, 309–314
    clinical data and results of, 357
Clot formation, graft healing, 41–42
Complications
  lamellar keratoplasty, 264–276
    operative, 264–268
    postoperative, 269–276
  partial penetrating keratoplasty, 192–196
    postoperative, 206–231
Conjunctiva and eyelids, 94–95
Contralateral autografts, 52
Corneal blindness. *See* Blindness, corneal
Corneal dystrophies. *See* Dystrophies, corneal

Corneal pathology. *See* Pathology, corneal
Corneal repair
  grading, 331–332
  keratoplasty for, 331–334
  postoperative management, 334
  several hours after injury, 334
  surgical procedures, 145–146
  when injury is recent, 332–333
Corneas
  donor. *See* Donor material
  recipient. *See* Recipient eye
Cosmetic keratoplasty, 147, 314–315

Deposits in cornea, histopathology of, 394
Descemetocele and corneal fistula, 113
Descemet's membrane, 26, 69
Diabetes mellitus, 91
Dissection
  of donor graft, 259–262
  of recipient cornea, 255–259
    postdissection procedures, 259
    secondary dissection, 257–258
Dohlman collar-button prosthesis, 342–344
Donor button
  dissection of, 259–262
  excision of, 173–175
Donor grafts, 35
  dissection of, 259–262
  enucleation of eyeball, 54, 55
  fresh corneas, 66
  heterologous, 52
  interval between death and removal, 54–56
  intraocular disease of donor eye, 68
  for penetrating keratoplasty, 51
  preparation of, 171–173
  preservation techniques, 3, 51, 60–64
  slit lamp examination, 69
  sources of, 77–78
  suitability of, 64–69
  synthetic implants, 52
  synthetic material, 51
  therapeutic effect on recipient cornea, 39–40
  types of, 52
  viability of, 54–64
    under tropical conditions, 55–57
  willed donations, 64–65
Donor material, 3, 51–69
  age of donor, 66–67
  bacteriology of donor eyeball, 58–60
  biological nature of, 352
  blood group and Rh compatibility, 57–58
  causes of death of donors and, 56–57, 67–68
  condition of, 44–45
  criteria for donor selection, 52–54
  determination of viability, 65–66
Dressings
  partial penetrating keratoplasty, 187–189, 197–199
    first postoperative, 197–198
    subsequent dressings, 198–199
Dystrophies, corneal, 14, 305–309
  circumstances affecting keratoplasty, 305–309
  Fuchs' dystrophy, 9, 11, 115, 380
  histological examination, 379–383
  indications for keratoplasty, 104–105, 305–309
  lattice, 382
  macular dystrophy, 380–381
  types of, 358

Ectasia of corneal graft, 217–218
Edema
  corneal, 100
  epithelial, 50
  graft edema and bullous keratopathy, 222–226
  treatment of, 224–225
Emergency keratoplasty, surgical procedures, 145–146
Endothelium, 25–26

Enucleation, 72
  legal regulations, 80
Epikeratoprosthesis, 12
Epithelium of cornea, 21–22
  edema, 50
  graft healing, 41–42
Examination of eye, 126–128
Experimental studies, in monkeys, 15
Eye banks, 3, 71–73
  central eye banks, 76
  in developing countries, 73–74
  donation cards, 72
  donor eyes, 72–75
  equipment, 75–76
  legal regulations of donation of eyes, 78–81
  national, 73, 77
  need for, 71–72
  organization of, 72–77
  processing of donor eyeballs, 81–83
  publicity campaigns, 74
  records, 73
  services, 76–77
  sources of donor material, 77–78
  willed donations, 72
Eyeballs, preservation of, 3
Eyelids and conjunctiva, 94–95

First World Corneal Congress, Washington, D.C. (1964), 12
Fistula, corneal, 113
Flat anterior chamber, 207–208
Followup studies, 359–360
Fuchs' dystrophy, 9, 11, 115, 380

Girard optical shaft prosthesis, 347–348
Glaucoma, 14, 68, 115
Graft healing, 41–50
  adherence of iris to graft margin, 48
  allergic reactions, 50
  apposition of donor-recipient edges, 47
  condition of donor material, 44–45
  condition of recipient eye, 45–47
  corneal thickness, 47
  histological changes, 41–50
  retrocorneal connective tissue membrane, 48–49
  tissue compatibility, 49–50
Grafts and grafting
  autografts, 31, 52, 239–241
  autologous, 31
  biogenesis of corneal transplantation, 31–36
  contralateral, 31
  determining size of, 169–171
  donor, 35
  edge-to-edge suturing, 3, 47
  failure of, 44–50
  fate of donor tissue, 36–39
  full-thickness, 4
  healing of graft-host junction, 41–50
  heterologous grafts, 31
  homologous grafts, 31–32, 35–36, 52–53
  lamellar grafting, 4, 7
  regrafting. *See* Regrafting
  rejection, 3, 32, 270
  retraction, lamellar keratoplasty, 275
  size of, 169–171, 352
  techniques of securing, 189–192
  tissue incompatibility, 32
  ulcers, lamellar keratoplasty, 272–275
Gunpowder particles, 281
  multiple foreign bodies, 112–113

Halothane, 3
Healing of graft-host junction, 41–50
Herpetic keratitis, 14
  lamellar keratoplasty for, 277
Heterografts, 34
Heterologous grafts, 31–32, 52
Histochemical techniques, 361
Histological basis of graft healing, 41–50
  adherence of iris to graft margin, 48

apposition of donor-recipient edges, 47
clot formation, 41–42
condition of donor material, 44–45
condition of recipient eye, 45–47
corneal thickness, 47
epithelial bridge, 41–42
hydration, 43–44
nerve endings, 43
pathological basis of graft failure, 44–50
retrocorneal connective tissue membrane, 48–49
tissue compatibility, 49–50
transparency of graft, 44–50
Histopathology of corneal tissue, 361–394
blood staining of cornea, 375–376
corneal dystrophies, 379–383
deposits in cornea, 394
examination procedures of excised corneas, 362–364
infected corneal ulcer, 365–370
with associated keratomalacia, 370–373
keratoconus, 376–378
multiple corneal foreign bodies, 378–379
pterygium, 390–394
regrafts, 383–390
failed lamellar grafts, 386–390
failed penetrating grafts, 383–386
smallpox, 364–365
trachoma, 373–375
Historical review, 7–12
chronology of keratoplasty, 10–11
corneal grafting, 7–12
keratoplasty, 7–12
History, patients, 123–126
Homologous grafts, 31–32, 35–36, 52–53
Hypertension, 91
Hyphema, 208–209

Illumination, 149–150
Immunoglobulins, 33
India
age of onset of corneal blindness, 15
corneal blindness, 14
corneal opacities, 12
eye banks, 72, 74
legal regulations, 79
Indore Corneal Surgery Unit, 12
Industrial accidents
cause of corneal blindness, 14
corneal repair, 331–334
Infections
corneal ulcers, 365–370
lamellar keratoplasty, 271
postoperative, 209–210
Injuries, 14
corneal repair, 331–334
Instruments, 3, 8–19, 151–152
care of, 153–154
International Eye Bank, Washington, D.C., 62, 72
Interstitial keratitis, 9
Intraocular disease of donor eye, 68
Intraocular tension, 93
preoperative control of, 135–136
secondary rise in, 218–219
Ipsilateral autografts, 52–53
Iridectomy, optical, 12
Iridocyclitis, 50
postoperative complication, 221–222
Iris, adherence to graft margin, 48
Iris incarceration, 16
and anterior chamber, 100–102
corneal scars and, 3, 177–178, 352
Iris prolapse, 210–211

Keratectomy, 323–326
indications for, 323–324
surgical procedures, 144–145
preparatory, 132–133
for symblepharon, 324–326
for vascular cornea, 324
Keratitis
herpetic, 14, 277
interstitial, 9
neuroparalytic, 117

Keratitis sicca, 12
Keratoconjunctivitis sicca, 97
Keratoconus, 9, 14
  apposition of donor-recipient edges, 47
  case selection, 86, 103–104
  histological examination, 376–378
  indications for keratoplasty, 103–104
  penetrating keratoplasty for, 231–235
  square-graft surgery, 235–237
Keratomalacia, infected corneal ulcer and, 370–373
Keratomileusis and keratophakia (refractive keratoplasty), 318–319
  surgical procedures, 144
Keratopathy, 4
  bullous. *See* Bullous keratopathy
Keratoplasty
  for aphakic eyes, 115–116, 303–305
  case selection. *See* Case selection
  circumstances affecting, 146–147, 297–315
  clinical corneal condition, 17
  in children, 309–314
  chronology of, 10–11
  contraindications for, 5, 117–118
  for corneal blindness, 14
  corneal dystrophies, 305–309
  cosmetic, 314–315
  general indications for, 146–147
  grouping of recipients, 117
  historical review, 7–12
  lamellar. *See* Lamellar keratoplasty
  lens changes, 297–303
    cataract caused by perforating injury of eye, 299
    cataractous lens at penetrating regrafting, 301–302
    complicated cataract with gross and ectatic corneal scars, 301
    injury to capsule of transparent lens during keratoplasty, 299–300
    lens subluxation as result of forward movement of iris-lens diaphragm, 300–301
    small anterior capsular dot opacities, 289–299
    uncomplicated cataract and, 302–303
  limitations, 85
  "mercy," 16, 102, 116, 243, 251
  optical, 146
  partial penetrating keratoplasty. *See* Partial penetrating keratoplasty
  penetrating. *See* Penetrating keratoplasty
  preparatory, 130–135, 146
  results and followup, 351–360
  selection of patients. *See* Case selection
  special procedures, 317–334
    corneal repair, 331–334
    keratectomy, 323–326
    keratomileusis and keratophakia (refractive keratoplasty), 318–319
    mushroom and step grafts, 319–323
    posterior lamellar keratoplasty, 317–318
    surgery for pterygium, 326–331
  summary of clinical data, 355, 356
  surgical procedures, 139–147
    corneal repairs and emergency keratoplasty, 145–146, 331–334
    indications for, 146–147
    keratectomy, 144–145, 323–326
    keratomileusis, 144, 318–319
    lamellar keratoplasty (partial-thickness grafts), 142–143, 317–318
    mushroom grafts, 144, 319–323
    penetrating keratoplasty (full-thickness grafts), 139–142
    prosthokeratoplasty, 144
  therapeutic. *See* Therapeutic keratoplasty

therapeutic indications, 109–110
total and subtotal penetrating, 243–251
types of corneal pathology for, 17
Keratoprosthesis, 52

Lamellar grafts and grafting
following complicated penetrating graft, 288–289
histopathology of failed, 386–390
penetrating grafting following preparatory or unsuccessful, 289–290
for pterygium, 328–331
regrafting following failed lamellar graft, 287–288
Lamellar keratoplasty, 4, 9, 17, 253–285
clinical conditions, 355
complications
operative, 264–268
postoperative, 269–276
dissection of donor graft, 259–262
postdissection procedures, 259
secondary dissection, 257–258
dissection of recipient cornea, 255–259
donor material, 3, 57, 259–262
full-thickness, 143
partial peripheral, 142, 278–279
partial or total, 142, 278–279
peripheral, 142–143
posterior, 143, 317–318
postoperative complications, 269–276
blood in the interface, 270–271
bullous keratopathy, 276
graft rejection, 270
graft retraction, 275
graft ulcer, 272–275
infection, 271
premature loss of sutures, 271–272
vascularization, 272
postoperative management, 268–269
surgical procedures, 142–143, 253–285
suturing, 262–264
therapeutic, 277–286
indications for, 277–286
indolent ulcers and recurrent erosion of the cornea, 277–279
limbal dermoids and nevi, 284–285
malignant pterygium, 281
multiple foreign bodies in cornea (gunpowder), 281
recurrent herpetic keratitis, 277
recurrent hypopyon ulcer, 279
squamous-cell limbal carcinoma, 282–284
toilet of eye, 264
total, 279
trephination, 254–255
Lattice dystrophy, 382
Lens
unavoidable lens extraction, 195–196
Lens changes
cataract caused by perforating injury of eye, 299
cataractous lens at penetrating regrafting, 301–302
complicated cataract in eyes with gross and ectatic corneal scars, 301
injury to capsule of transparent lens during keratoplasty, 299–300
and keratoplasty procedures, 297–303
lens subluxation as result of forward movement of iris-lens diaphragm, 300–301
small anterior capsular dot opacities, 298–299
uncomplicated cataract and keratoplasty, 302–303
Lens and posterior segment, case selection, 93–95

Leukoma adhaerens, 11, 16, 102
case selection, 86, 89
Limbus
anatomy of, 26–27
limbal dermoids and nevi, 113–114, 284–285
squamous-cell carcinoma, 282–284

Macular dystrophy, 380–381
Magnification, 150
Malnutrition, 91–92, 102
Membranes
Descemet's, 26, 69
retrocorneal connective tissue membrane, 48–49
"Mercy keratoplasty," 16, 102, 116, 243, 251
Metabolism, corneal, 27–29
Multiple corneal foreign bodies, 112–113
histological examination, 378–379
lamellar keratoplasty to remove, 281
resulting from blast injury, 378–379
Mushroom grafts, surgical procedures, 144, 319–323

Neoplasms, 113–115
Nerve fibers of cornea, 20
Neuroparalytic keratitis, 117
Nevi, limbal, 284–285

Operative requirements, 149–167
assistant in corneal surgery, 159
general anesthesia, 154–156
procedure for, 156–157
illumination, 149–150
importance of asepsis, 159–160
instruments, 151–152
care of, 153–154
local anesthesia, 157–159
magnification, 150
preoperative considerations, 160–161
importance of miosis, 162–163
morning of operation, 162–163
night before operation, 162
one day prior to surgery, 161–162
preparation for operation under local anesthesia, 163–165
procedures in operating room, 163
suture material, 152–153
under general anesthesia, 165
Optical iridectomy, 12
Optical keratoplasty, 146

Pain, partial penetrating keratoplasty, 199–200
Partial penetrating keratoplasty, 169–242
complications, 192–196, 206–231
anterior synechiae to graft-host junction, 211–216
bullous keratopathy, 225–226
ectasia, 217–218
flat anterior chamber, 207–208
graft edema, 222–225
graft epithelial ulcer, 229
hyphema, 208–209
infection, 209–210
iridocyclitis, 221–222
iris prolapse, 210–211
premature loss of sutures, 216–217
retrocorneal membrane, 229–231
secondary rise in intraocular tension, 218–219
tissue-immune reaction, 227–229
preoperative considerations, 228
prevention and treatment, 228–229
unavoidable lens extraction, 195–196
vascularization, 219–221
determining size of graft, 169–171
excision of donor button, 173–175
hospitalization, 206
postoperative management, 196–205
antibiotics and vitamins, 203–204
first dressing, 197–198
pain, 199–200
removal of sutures, 204–205

rest, 196–197
steroids, 200–203
subsequent dressings, 198–199
preparation of donor eye, 171–173
procedure on recipient eye, 175–187
air injection, 185–187
corneal scars with iris incarceration, 177–178
suturing, 181–185
techniques of securing graft, 189–192
toilet and dressing, 187–189
variant procedures, 231–241
for keratoconus, 231–238
penetrating autografting, 239–241
therapeutic penetrating keratoplasty, 238–239
Pathology, corneal, 9
age at onset of, 351
causes of, 354
history of, 123–126
Patient's history, 123–126
Pemphigus, 117
Penetrating grafts and grafting
autografting, 239–241
following preparatory or unsuccessful lamellar graft, 289–290
histopathology of failed, 383–386
lamellar grafting following complicated, 288–289
penetrating regrafting following failed, 290–295
Penetrating homokeratoplasty, 8
Penetrating keratoplasty, 3, 11, 16–17
clinical conditions, 355
complete penetrating keratoplasty, 139
donor material, 51
partial. *See* Partial penetrating keratoplasty
partial penetrating graft, 139
subtotal, 140–141, 243–251
surgical procedures, 139–142
therapeutic keratoplasty, 238–239
total, 142, 243–251
Penetrating regrafting
anesthesia for, 294
complicated regrafts, 291–292
following failed penetrating graft, 290–295
postoperative management, 295
significance of cause of primary graft failure, 293
simple regrafts, 291
size of regraft, 292–293
special operative considerations, 294–295
timing of, 292
Physiology of cornea, 27–40
biogenesis of corneal transplantation, 31–36
corneal metabolism, 27–29
fate of donor tissue, 36–39
therapeutic effect of donor graft on recipient cornea, 39–40
transparency and avascularity, 29–31
Preoperative procedures
choice of surgery, 129–130
control of intraocular tension, 135–136
examination of eye, 126–128
investigations, 128
patient's history, 123–126
preparatory surgery, 130–135
Preservation of donor corneas, 3, 60–64
deep-freezing, 61
dehydration in glycerin, 62–64
dissecting corneoscleral disc, 62–64
with liquid nitrogen, 61–62
in recipient serum, 61
Prostheses
with biological interface, 344–349
Girard optical shaft prosthesis, 347–348
Refojo and Kalevar encapsulated implant, 348–349
Strampelli osteo-odonto-keratoprosthesis, 344–347

Cardona nut-and-bolt prosthesis, 342
Cardona through-and-through prosthesis, 338–342
development of materials, 335–336
Dohlman collar-button, 342–344
implants and procedures, 336–344
Stone anterior and posterior projection implants, 336–338
Prosthokeratoplasty, 5, 12, 52, 335–349
development of materials, 335–336
implant surgery, 144, 336–344
Cardona nut-and-bolt prosthesis, 342
Cardona through-and-through prosthesis, 338–342
Dohlman collar-button prosthesis, 342–344
Stone anterior and posterior projection implants, 336–338
prostheses with biological interface, 344–349
Girard optical shaft, 347–348
Refojo and Kalevar encapsulated implant, 348–349
Strampelli osteo-odonto-keratoprosthesis, 344–347
Psychological buildup of recipient, 92
Pterygium, malignant, 393–394
case selection, 111–112
histopathology, 390–394
lamellar keratoplasty, 281
malignant, 393–394
surgery for, 326–331
techniques of lamellar grafting, 328–331

Recipient eye
condition of eye, 45–47
dissection of cornea, 255–259
secondary dissection, 257–258
surgical procedure
air injection, 185–187
corneal scars with iris incarceration, 177–178
partial penetrating keratoplasty, 175–187
suturing, 181–185
Refojo and Kalevar encapsulated implant, 348–349
Refractive keratoplasty, 147
Refractive power of cornea, 20
Regrafting, 287–295
anesthesia for, 294
histopathology of regrafts, 383–390
failed lamellar grafts, 386–390
failed penetrating grafts, 383–386
lamellar regrafting
following complicated penetrating graft, 288–289
following failed lamellar graft, 287–288
penetrating grafting
complicated regraft, 291–292
following failed penetrating graft, 290–295
following preparatory or unsuccessful lamellar graft, 289–290
postoperative management, 295
significance of cause of primary graft failure, 293
simple regraft, 291
size of regraft, 292–293
timing of regrafting, 292
postoperative management, 295
special operative considerations, 294–295
Results and followup, 351–360
factors influencing, 351–352
age at onset of corneal pathology, 351
biological nature of donor cornea, 352
extremely-high-risk cases, 352
iris incarceration in corneal scar, 352
size of graft, 352
vascularization, 352
Retinoblastoma cells, 68
Retrocorneal membrane, 229–231

Scars, corneal
complicated cataract in eyes with, 301
and iris incarceration, 177–178, 352
Senile endothelial changes, 14
Smallpox, 102
corneal conditions caused by, 364–365
South America, corneal blindness, 13
Soviet Union, corneal blindness, 13
Squamous-cell limbal carcinoma, 114
lamellar keratoplasty for, 282–284
Square-graft surgery, for keratoconus, 235–237
Staphyloma, 11, 16, 102
case selection, 86
Step grafts, 144, 319–323
Steroids, 3, 34–35, 200–203
Stevens-Johnson syndrome, 12, 98, 117
Stone anterior and posterior projection implants, 336–338
Stroma, 23–24
Surgery, corneal
anterior synechiotomy, 130–131
case selection. *See* Case selection
choice of, 129–130
classification and definitions, 139–147
corneal repairs, 145–146
emergency keratoplasty, 145–146
indications for, 3, 146–147
keratectomy, 132–133, 144–145, 323–326
keratomileusis, 144
lamellar keratoplasty (partial-thickness grafts), 142–143, 253–285
full-thickness, 143
partial or total lamellar grafts, 142, 278–279
peripheral, 142–143
posterior lamellar keratoplasty, 143, 317–318
mushroom graft, 144, 319–323
operative requirements, 149–167
penetrating keratoplasty (full-thickness grafts), 139–142
complete penetrating keratoplasty, 139
partial penetrating graft, 139
subtotal penetrating keratoplasty, 140–141, 243–251
total penetrating keratoplasty, 142, 243–251
peritomy, 133–135
preoperative investigations, 128, 160–163
preparations for, 163–167
under general anesthesia, 165
under local anesthesia, 163–165
preparatory, 130–135
anterior synechiotomy, 130–131
keratectomy, 132–133
peritomy, 133–135
symblepharon, 131–132
present status, 3
prosthokeratoplasty, 144
symblepharon, 131–132
total penetrating grafts, 3, 140–142, 243–251
tropical and developing countries, 5
Sutures and suturing
lamellar keratoplasty, 262–264, 271–272
needles and threads, 3, 152–153
premature loss of, 216–217
lamellar keratoplasty, 271–272
recipient eye, 181–185
removal of, 204–205
Symblepharon, 131–132
keratectomy for, 324–326
Synechiotomy, anterior, 130–131
Synthetic material, 3, 52
implants and membranes, 11–12, 51

Tear-film abnormalities, 21, 117
Tension, intraocular, 93
preoperative control of, 135–136
secondary rise in, 218–219
Therapeutic keratoplasty, 109–110, 146

Therapeutic keratoplasty—*Continued*
clinical conditions for, 358
lamellar keratoplasty, 277–286
indolent ulcers and recurrent erosion of cornea, 277–279
limbal dermoids and nevi, 284–285
malignant pterygium, 281
multiple foreign bodies in cornea (gunpowder), 281
recurrent herpetic keratitis, 277
recurrent hypopyon ulcers, 279
squamous-cell limbal carcinoma, 282–284
penetrating keratoplasty, 238–239
Tissue compatibility, 8
graft healing, 49–50
therapeutic effect of donor graft on recipient cornea, 39–40
Tissue-immune reaction, 5, 34–35, 49
postoperative complication, 227–229
preoperative considerations, 228
prevention and treatment, 228–229
Toilet and dressings
lamellar keratoplasty, 264
partial penetrating keratoplasty, 187–189
first postoperative, 197–198
subsequent dressings, 198–199
Total penetrating keratoplasty, 3
surgical procedures, 140–142, 243–251
complications, 248–249
postoperative management, 247–251
Trachoma, 93, 98–99, 106–107
Trachomatous cornea, 93, 98–99, 106–107
case selection, 106–109
histological examinations, 373–375
keratoplasty for, 357
Trachomatous keratectasia, 107
Transparency of cornea, 29–31
Transplantation
biogenesis of corneal, 31–36
fate of donor tissue, 36–39
therapeutic effect on recipient cornea, 39–40
tissue incompatibility, 32
Trephination, lamellar keratoplasty, 254–255
Tropical countries
corneal blindness, 15
corneal surgery, 5
eye disease, 12
viability of donor corneas, 55–57

Ulcers, corneal, 110–111
graft, 272–275
graft epithelial, 229
indolent, and recurrent erosion of the cornea, 277–279
infected, 365–370
and associated keratomalacia, 370–373
histological examinations, 365–370
partial peripheral lamellar keratoplasty, 278–279
recurrent hypopyon, 274
total lamellar keratoplasty, 279
United States, corneal blindness, 13

Vascularization, 97–100, 324, 352
case selection, 97–100
lamellar keratoplasty, 272
postoperative complication, 219–221
prognostic significance, 98
superficial, 98
Visual acuity, preoperative, 85–89
Vitamins and antibiotics, 203–204

Western Europe, corneal blindness, 13
Willed donation of eyeballs, 64–69
age of donor, 66–67
cause of death of donor, 67–68
determination of viability of donor cornea, 65–66
eye banks. *See* Eye banks
intraocular diseases of donor eye, 68–69

Xerosis, 117